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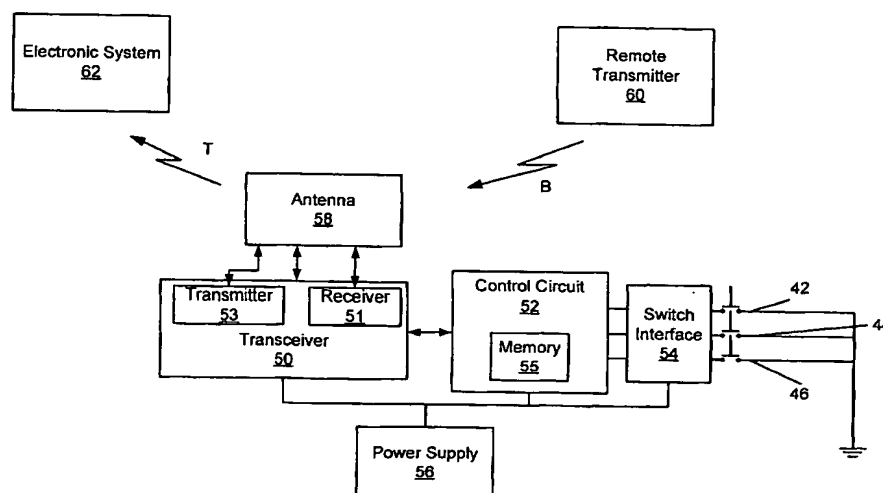
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Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE,

[Continued on next page]

(54) Title: **TRAINABLE REMOTE CONTROLLER AND METHOD FOR DETERMINING THE FREQUENCY OF A LEARNED CONTROL SIGNAL**



(57) Abstract: A trainable transceiver for learning signal characteristics of an RF control signal received from a remote control transmitter used to remotely actuate a device and for subsequently transmitting a modulated RF signal having the learned signal characteristics includes an antenna, a wideband receiver and a control unit. The wideband receiver is coupled to the antenna and is configured to receive an RF control signal from the remote control transmitter. The RF control signal includes a control code, a set of data characteristics and an RF carrier frequency. The control circuit is coupled to the wideband receiver and has a training mode characteristic from the set of data characteristics and to identify at least one RF frequency associated with the RF control signal based on the at least one data characteristic.



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- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 181 255 B1 (FARRIS BRADFORD L ET AL) 30 January 2001 (2001-01-30)	1-3, 5-11, 13-23
Y	column 8, line 57 - column 11, line 20 column 12, line 25 - column 14, line 33	4,12
X	US 5 854 593 A (DYKEMA KURT A ET AL) 29 December 1998 (1998-12-29)	24
Y	column 5, line 51 - column 6, line 27 column 7, line 16 - line 51 column 16, line 48 - column 18, line 67	4,12

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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G document member of the same patent family

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Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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US 6181255	B1	30-01-2001	NONE	
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US 5854593	A	29-12-1998	DE 19732143 A1	29-01-1998
			GB 2315893 A ,B	11-02-1998
			GB 2322215 A ,B	19-08-1998
			JP 10285660 A	23-10-1998